AMENDMENTS TO THE SPECIFICATION

Page 1

Please replace the 1st paragraph with the amended paragraph as follows:

The present invention relates to a semiconductor device having a plurality of single crystal semiconductor layers each containing at least one of silicon (Si) and germanium (Ge), and carbon (C) as essential constituent elements and a method of manufacturing the same. The semiconductor device of the invention concerns a technique which is effectively applied to high frequency amplifying semiconductor devices and integrated circuits used ~~for~~ in wireless communication apparatus and, further, a technique it is useful for use in broad forbidden band semiconductor devices for wireless communication in quasi-milliwave to milliwave regions.

Page 1

Please replace the 2nd paragraph, bridging to page 2, line 7, with the amended paragraph as follows:

Along with rapid popularization of mobile communication terminals and internet communication in recent years, wireless communication capacity has been increased rapidly year by year. Accordingly, necessary band width in the wireless communication has been extended and increase for the demand of communication apparatus intended for usual consumers is expected necessarily in higher frequency bands, that is, from quasi-milliwave to milliwave regions. Semiconductor devices used for electronic circuits in the frequency band described above are predominantly those using compound semiconductor materials represented by GaAs. Recently, Si carbide (hereinafter simply referred to as SIC) having broader forbidden width and more preferred electron transportation characteristics compared with GaAs ~~have~~has

been ~~considered perspective~~ investigated since it is applicable to higher power density at high frequency waves.

Page 2

Please replace the paragraph beginning on line 8 and bridging to page 3, line 2, with the amended paragraph as follows:

Existent methods of forming single crystal semiconductor layers containing Si, Ge, and C, were reported, for example, in Japanese Patent No. 2798576 (Paragraph 10, Fig. 1). In the manufacturing method of the prior art example, a gaseous starting material containing Si atoms, a gaseous starting material containing C atoms and a gaseous starting material containing Ge atoms are used. Further, such gaseous starting materials are thermally decomposed and grown into an Si epitaxial layer containing C and Ge at a vacuum degree of 10^{-2} Torr or less capable of neglecting the gas phase reaction. Further, the prior art example shows that a substrate having, ~~on at least~~ on its surface, at least an Si layer and a mask pattern formed on the Si layer is disposed in a gas phase growing vessel, and a gaseous starting material containing Si atoms, a gaseous starting material containing C atoms and a gaseous starting material containing Ge atoms are ~~given~~ applied simultaneously to the surface of the substrate at a vacuum degree capable of neglecting the gas phase reaction to selectively grow the Si layer containing C and Ge only at the region on the substrate where the Si layer is exposed.

Page 3

Please replace the paragraph beginning on line 10 with the amended paragraph as follows:

Further, an existent example of a semiconductor device using a single crystal semiconductor layer containing Si, Ge, and C is also described in JP-A No. 9-283533 (Paragraph 25, Fig. 6). Fig. 19 shows the cross-sectional structure of a bipolar transistor of this example. A high concentration n-Si region 102 is grown on a p-Si substrate 101, an n-Si layer 103 is formed thereon as a collector region, on which a p-SiGe layer 104 as a base region and an n-SiGeC mixed crystal 105 as a ~~base~~ an emitter region ~~is~~ are grown. Each of the junction boundaries for the collector, the base and the emitter is formed by, e.g., the UHV/CVD process or the like so that relocation is not caused. As the starting gas for effecting epitaxial ~~growinggrowth~~, an organic silane such as silane, disilane, or methyl silane, or an organic germane such as methyl germane and, optionally, ethylene is used. As the doping gas, arsenic or phosphorus is used as an n-impurity and boron or the like is used for a p-impurity.

Page 4

Please replace the 2nd paragraph with the amended paragraph as follows:

Further, in a semiconductor integrated circuit for use in communication, not all of the circuits handle signals in a high frequency region ~~but~~ since integrated circuits requiring information processing of a large capacity in a low frequency region are also necessary. For the integrated circuits, it is optimal to use existent Si semiconductor integrated circuits. Accordingly, a desirable integrated circuit is a combination of an SiC semiconductor device and an Si semiconductor device described above. In this case, while individual semiconductor chips can be mounted in one module, it is more preferred to manufacture both of the semiconductor

devices on one and the same substrate. In order to attain the structure, it is necessary to form an SiC layer on an Si substrate.

Page 6

Please replace the last paragraph, bridging to page 7, line 12, with the amended paragraph as follows:

To be more specific, in the invention, it is at first important to selectively grow the semiconductor layer locally in the Si single crystal substrate. Distortion in the grown semiconductor layer is moderated by controlling the grown area of the semiconductor layer. As a result, lattice defect density in the semiconductor layer can be lowered. In the invention, substrates having an Si single crystal layer can be used as a substrate for crystal growing ~~in-stead~~ instead of the Si single crystal substrate. A typical example of the substrate having the Si single crystal layer is, for example, an SOI (Silicon On Insulator) substrate. Further, it is also possible, for example, to form a desired epitaxial layer on a semiconductor substrate and use the same as the substrate for crystal growing in the invention. In the present specification, the substrates having the Si single crystal layer applicable to the invention, as well as the substrates described above are referred to as "Si semiconductor substrate.

Page 8

Please replace the 3rd paragraph with the amended paragraph as follows:

In view of the semiconductor device described above, it is preferred that the ~~conduction~~ conductivity type is different between the second crystal layer and the third crystal layer. Further, the forbidden band width of the

second crystal layer may be made smaller than that of the third single crystal layer.

Page 8

Please replace the last paragraph, bridging to page 9, line 6, with the amended paragraph as follows:

In the constitution of the invention, electrons can be confined in the second single crystal layer for forming the semiconductor layer of smaller forbidden band width (that is, second single crystal layer) as a channel, by using the semiconductor layer of larger forbidden band width (that is, third single crystal layer) as a barrier layer. In this case, favorable ON-OFF characteristics can be obtained when both of the semiconductor layers are different from each other in ~~conductive~~ conductivity type and a more specific example will be explained referring to Embodiment 4.

Page 12

Please replace the paragraph beginning on line 11, with the amended paragraph as follows:

Further, another method of manufacturing a semiconductor device comprises the steps of forming an insulating film having an opening on an Si substrate semiconductor substrate, forming a first single crystal layer in the opening, forming a second single crystal layer on the first single crystal layer, and forming a third single crystal on the second single crystal layer, in which the first single crystal layer, and the second single crystal layer, and the third single crystal layer each comprises one or both of Si and G, and C as the main ingredients and having a stoichiometric ratio of the sum of Si and Ge to C being about 1:1, and the forbidden band width of at

least one of the first single crystal layer, the second single crystal layer, and the third single crystal layer is different from those of the ~~ethers~~other layers.

Page 12

Please replace the last paragraph bridging to page 13, line 8, with the amended paragraph as follows:

What is important in the method of manufacturing the invention is to use an organic gas having an Si atom-C atom bond and, further, use an organic gas having a Ge atom-C atom bond as a starting gas for effecting epitaxial ~~growing~~ growth of each of the semiconductor layers. Thus, when the (SiGe)C layer is crystallographically grown, it is possible to achieve crystal growing with SiC bond and Ge-C bond maintained. This enables to obtain a single crystal (SiGe)C layer with the stoichiometric ~~ration~~ ratio of the sum of Si and Ge to C being about 1:1.

Page 13

Please replace the paragraph beginning on line 9, with the amended paragraph as follows:

The growing temperature in the epitaxial growing of the multi-layered structure depends naturally on the kind of the starting gases used and the requirement for the growing speed and a temperature from 500 to 900°C is often used. Further, also the growing pressure used for the epitaxial growing also depends on the kind of the starting gases and the requirement for the growing speed and a pressure from 0.1 to 10,000 Pa is often used.